

FIG. 1

Job Data Table

<i>Field Name</i>	<i>Field Type</i>	<i>Field Description</i>
No	numerical	the number of entrusted job from iTDAS
Done	character	the record whether the job had been finished
User	character	the user of the job
Date	time	the date and time of the job
Type	character	the package type of the job
Die Size L	numerical	the length of die size
Die Size W	numerical	the width of die size
Pad Size L	numerical	the length of pad size
Pad Size W	numerical	the width of pad size
Package Size L	numerical	the length of package size
Package Size W	numerical	the width of package size
TBL	numerical	the number of thermal ball along the row direction
TBW	numerical	the number of thermal ball along the column direction
BRL	numerical	the number of ring ball along the row direction
BRW	numerical	the number of ring ball along the column direction
Layer	numerical	the number of substrate layer
PW	numerical	the number of dissipation power
Check	character	whether the job is successful
Memo	character	the remark or memo of the job

F I G . 2

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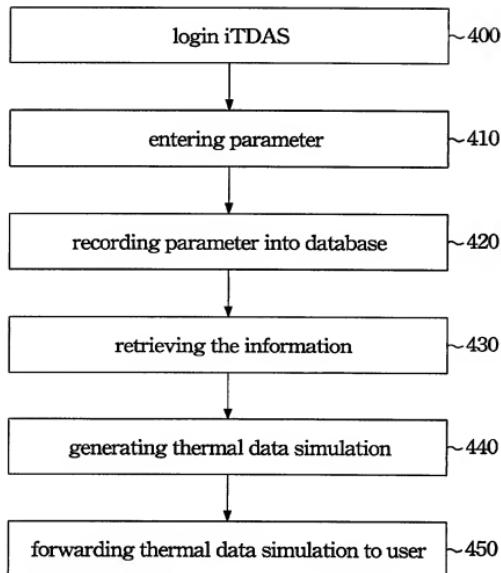


FIG. 3

► 1. The fundamental profile

User name	CATHY
Requested time	2001/2/6 AM 09:49:07
Completed time	2001/2/6 AM 09:52:17
Account quota	9999
Quota used	311
Account validation	1999/11/15~2002/12/31

► 2. Simulation condition

Job title	ITDAS HSBGA
Package type	HSBGA
Ball count	388
Pitch (mm)	1.27
PKG size (mm)	35 X 35
Balls matrix	26 X 26
Ball rows depth L	4
Ball rows depth W	4
Thermal balls	6 X 6
Thermal vias	81
Pad size (mm)	12 X 12
Die size (mm)	8 X 8
Heat slug	Y
Substrate layers	4L
PCB layers	4L
Power (watt)	3
Maximum junction temperature (°C)	125
Ambient temperature (°C)	85

► 3. Thermal data

Vair (m/s)	0.0	1.0	2.0
θ_{ja}	13.3	11.5	10.1
ϕ_{jt}	2.96	2.95	2.98
θ_{jc} (°C/W)	4.2		

Heat flow path

Heat dissipated from PCB (%)	68.6
Heat dissipated from package top (%)	14.1
Heat dissipated from others (%)	17.3

► 4. Solution

Your required θ_{jc} is 13.3 (°C/W)

FIG. 4

Internet Thermal Data Automation Service

Job Title : **Package Size 27X27 Path 1.5** **NEXT STEP** **MAIN MENU**

1. PACKAGE SIZE & PITCH

PBGA PACKAGE SIZE (mm x mm) : **27X27** ▼ $P_L \times P_W$

PBGA Pitch (mm) : **1.5** ▼

FIG. 5

Job Title : **Package Size 27X27 Path 1.5** **(BACK STEP)** **NEXT STEP** **MAIN MENU**

2. BALL LAYOUT

Balls number in x and y direction
 $B_L \times B_W$: **15X15** ▼

Number of ring of ball in x and y direction
 BR_L : **5**
 BR_W : **5**

Thermal ball number in x and y direction
 (if B_L id odd (even), TB_L has to be odd (even))
 TB_L : **5**
 TB_W : **5**

Total number of thermal via : **25**

Total number of balls : **225**

FIG. 6

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Job Title : Package Size 27X27 Path 1.5

3 . DIE SIZE AND PAD SIZE

DIE SIZE , D_L (mm)
DIE SIZE , D_W (mm)
PAD SIZE , PD_L (mm)
PAD SIZE , PD_W (mm)

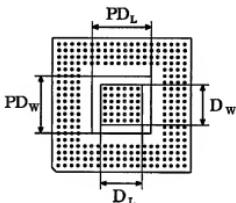


FIG . 7

Table 1 The maximum die size and copper pad size for each BGA size.

Package type	Package size (mm)	Ideal mas. die size (mm)
PBGA	14 X 22	8.4 X 15.8
	23 X 23	13.5 X 13.5
	27 X 27	15.9 X 15.9
	31 X 31	18.9 X 18.9
	35 X 35	21.9 X 21.9
	37.5 X 37.5	25.2 X 25.2
HSBGA	40 X 40	25.4 X 25.4
	27 X 27	12.8 X 12.8
	31 X 31	15.3 X 15.3
	35 X 35	15.3 X 15.3
	37.5 X 37.5	17.4 X 17.4
	40 X 40	17.4 X 17.4
LBGA	13 X 13	8.3 X 8.3
	15 X 15	10.3 X 10.3
	17 X 17	12.3 X 12.3
	19 X 19	14.3 X 14.3

FIG . 8

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Job Title : Package Size 27X27 Path 1.5

4 . OTHER CONDITION

Substrate Layers

PCB Layers

T_j (Max Junction Temperature)

T_A (Ambient Temperature)

Power Dissipation (Watt)

FIG. 9

Job Title : Package Size 27X27 Path 1.5

PKG Size (mm x mm)	27 X 27	Pitch (mm)	27 X 27
$B_L \times B_W$	15 X 15		
BR_L	5	BR_W	5
TB_L	5	TB_W	5
Die Size , D_L (mm)	8	Die Size , D_W (mm)	8
Pad Size , DP_L (mm)	9.5	Pad Size , DP_W (mm)	9.5
Substrate Layers	4L	PCB Layers	6L
T_j (Mix junction Temperature)	125	T_A (Ambient Temperature)	55
Power Dissipation (W)	2.6		

FIG. 10